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ABSTRACT

A study examined the effect of audiovisual-supported instruction on student grade point average. Two groups of students in economics classes taught by the same instructor served as the sample population for the study. The first group, consisting of 36 students, received four 1-hour lectures each week. The second group, consisting of 32 students, received minimal lecture material and heavy exposure to audiovisual media in the form of graphs, cassette lecture tapes, films, and other related materials. The grade point averages, pre- and posttest scores, and attrition rates of students in the experimental and control groups were compared. This comparison revealed that both methods of instruction were equally successful with respect to grade point average. Attrition rates were low in both classes--8.5 percent in the experimental group and 10 percent in the control group. Results clearly indicate that audio-visual aided instruction is effective; however, future studies and experimentation in the area of instructional methods will be required. (Detailed breakdowns of the study data are appended. (Author/MN)

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EFFECTS OF AUDIO-VISUAL SUPPORTED INSTRUCTION AND INSTRUCTION WITHOUT AUDIO-VISUAL SUPPORT ON STUDENT GRADE POINT AVERAGE

LEARNING THEORY AND APPLICATIONS

by

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ABSTRACT

In the 1981-1982 winter quarter, two economic classes were offered and taught by the same instructor. One class received lecture material in the traditional manner, attending four one-hour lectures each week. The 36 students in this class were designated the control group. The 32 students in the other class, known as the experimental group, received minimal lecture material and a heavy exposure to audio-media. These included view graphs, cassette lecture tapes, films and other audio materials and equipment. This group also was used quite extensively for individual discussions. Grade point averages, pre-test and post-test results, and attrition rates in the control and experimental groups were compared at the end of the semester using statistical techniques. The statement of the problem was as follows:

Do the students who receive minimal traditional lecture material with a heavy exposure to audio-media score significantly higher on grade point average than do students who receive lecture material in a traditional method?

Results of the study showed that: (1) both methods of instruction were equally successful with respect to grade point averages; (2) attrition rates were low in both classes -- experimental 8.5 percent and control 10 percent. Attached appendixes provide the study data.

Results clearly indicate that audio-visual aided instruction is effective; however, future studies and experimentation in the area of instructional methods will be required.

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INTRODUCTION

The community college is that component of post secondary education which is most sensitive to the local community social structure and its divergent needs. The community college's open-door policy has invited an influx of "new" students into the classroom, many of whom exhibit a low basic skill in reading and mathematics. It behooves the community college, now more than ever before, to develop new instructional programs that are flexible enough to serve the community at large (Cross:1971:1-25).

Enrollments in economic courses are increasing dramatically. In the face of such overwhelming demand, it is only natural that pressures for changes in courses are less strong. The dictum of the marketplace suggests that if demand is strong, the instructor must be doing something right.

Boulding (1975:428-430) states that empirical evidence on how much former students have learned is everywhere around us -- in the newspapers, in the current public opinion polls, and in the comments of our leaders and the people on the street about our economic issues.

The studies by Dwyer (1970), Dwyer (1971), LEPS (1979) and Meena (1979) found the effectiveness of visual aids compared favorably with traditional instruction. The findings of Kuo (1973), Hall (1977), and Coffman (1972), leading to a conclusion of superiority for their experimental film program over the conventional method, only indicates the need

for further research into the belief that media is more effective than conventional presentations.

Gordon and Falk (1972) state that if the teacher's role seems somewhat changed or demeaned by the use of videocassettes by students, in reality it is not. Whereas the instructor was an ultimate source of information, preparing lesson plans, and delivering them to a whole class, the instructor now guides and leads the students into ways of solving problems in order to develop in them a knack for independent thinking. The instructor then becomes a resource person who, in consultation with the students, directs the utilization of everything within the classroom environment. The role of the instructor as disciplinarian and information dispenser has faded away; the role is now one of consultant and guidance counselor in the classroom.

STATEMENT OF THE PROBLEM

For the purpose of this practicum, the research question that was examined was as follows: Of all students enrolled in basic economics classes, do the students who receive minimal traditional lecture material with a heavy exposure to audio-media score significantly higher on grade point average than do students who receive lecture material in a traditional manner?

HYPOTHESIS

In order to properly examine the research problem, a hypothesis was formulated. The hypothesis for this problem

was: Students who receive minimal traditional lecture material with a heavy exposure to audio-media score significantly higher on grade point average than do students who receive lecture material in a traditional manner.

BACKGROUND AND SIGNIFICANCE OF THE STUDY

Traditionally, college instructors have utilized the lecture as a primary vehicle of learning. However, in recent years, constraints such as limited instruction time and greater bodies of knowledge have compelled many instructors to seek new methods and techniques of maximizing student learning. One such technique to arrive on the educational scene has been audio-visual aided instruction. Audio-visual aided instruction is not new to American education. As early as 1918, the University of Minnesota offered the first course in visual instruction. In 1921, the University of Kansas and North Carolina State Teacher's College also followed with course offerings in visual instruction to prospective teachers. Then, in the summers of 1923 and 1925, the University of Arkansas instituted the same course (Bell:1975:11-13,20).

Moldstad (1974:22), who wrote a review of research studies in audio-visual effectiveness, noted that during the past twenty years, audio-visual research had produced significant evidence to justify the following assertions when audio-visual technology is carefully selected and used:

1. Significantly greater learning often results when media are integrated into the traditional instructional program.

2. Equal amounts of learning are often accomplished in significantly less time using instructional technology.

3. Multimedia instructional programs, based upon a "system approach," frequently facilitate student learning more effectively than traditional instruction.

4. Multimedia and/or audio-tutorial instructional programs are usually preferred by students when compared with traditional instruction.

A study on the effectiveness of overhead transparencies was conducted by Clayton Chance in the late 1950's. In this study, Chance and three other instructors of engineering descriptive geometry studied the effect of using 200 specially prepared transparencies on student learning. In comparing the instruction-plus-transparency approach versus the traditional lecture-discussion approach (both groups covering identical content), Chance was able to make the following conclusions:

1. Student groups who received instruction plus transparencies did significantly better on mean final course examination and final course grades;

2. All three faculty members unanimously agreed on the desirability of using transparencies in their teaching;

3. Utilization of transparencies resulted in saving 15 minutes per period; and,

4. Students reported an overwhelming preference for instruction which utilized transparencies (Moldstad:

1974:387-409). In this case, transparencies provided an effective and efficient means of instruction.

DEFINITION OF TERMS

To facilitate reading the remainder of this practicum, terms are defined below that are either unique, or are operationalized for this study.

Attrition Rate. Percentage of students withdrawing from a college course during a semester.

Audio-Visual Aids. Instructional materials which include slides, overhead transparencies, film strips (silent and sound), recordings, motion pictures (silent and sound), radio and television (includes videotape).

Audio-Tutorial Instruction. A method of instruction where various combinations of audio-visual media are used to present subject matter to students working independently.

Non-Major. Students with academic majors outside the area of economics.

Traditional Economic Course. A teacher-oriented course that consists of four one-hour lectures each week. Traditional forms of instruction are defined as instruction characterized by the use of lectures with the opportunity for students to ask questions.

Withdrawal (w-grade). Grade issued when a student drops a course if the student is passing at the time of the drop.

LIMITATIONS OF THE STUDY

1. This study is limited to a comparison of only two classes: one traditional, economic class versus one non-traditional, with heavy exposure to audio-visual material. These classes are not true random samples of the school population.

2. Only grade point averages will be compared in the two classes.

3. No attempt will be made to determine what the reasons are for withdrawal from the classes.

4. No analysis will be made of the differences in student environmental background.

5. Implications gained through information attained from this study may only have value to the Business Administration/Economics staff at Fayetteville Technical Institute.

BASIC ASSUMPTIONS

1. The two classes, one traditional lecture class and one non-traditional, heavy exposure to audio-visual material class, studied are reasonably homogenous (see Appendix A).

2. The same teacher for both classes will provide equal learning opportunities for all students.

3. The two classes involved in this study each have a normal distribution of intelligence.

4. The students in both classes have equal opportunities to achieve certain grades.

5. The pre-test did not sensitize the students to the post-test.

PROCEDURES FOR COLLECTING DATA

For this study, a classroom experiment strategy was used to facilitate the evaluation of the effectiveness of audio-visual aided instruction as it would occur in an actual classroom setting. The experiment was conducted in the Department of Business and Economics at Fayetteville Technical Institute, a two-year community college located in Fayetteville, North Carolina.

In the 1981-1982 winter quarter, two economic classes were offered and taught by the same instructor. One class received traditional forms of instruction by attending four one-hour lectures each week. The forty students in this class were known as the control group. Thirty-five students in the other class were known as the experimental group. This group received audio-visual aided instruction. This group was also used quite extensively for individual discussions. The experimental and control groups received a pre-test at the beginning of the experiment and a post-test at the conclusion. The mean scores on the pre-test and post-test results for matching students will be compared. At the conclusion of the experiment, a comparison was made of the grade point averages to determine if there was any significant difference between the groups.

Subjects for the study were not randomly selected on an individual basis, but were selected as a group. Since this course consisted of two class sections (one day and one evening), the day class was randomly selected as the control

group, while the night class was designated as the experimental group. An assumption was made that students in both groups were characteristic of a representative sampling of community college students.

The experimental group consisted initially of 35 students (13 females and 22 males), while the control group consisted of 40 students (16 females and 24 males). (See Appendix A.) The mean age of the experimental group was 22.7 years, while it was 26.0 years for the control group. However, at the conclusion of the experiment, usable data was obtained from only 32 and 36 of the experimental and control groups, respectively. Since matched test scores were necessary to conduct a student t-test, not all participants received both the pre-test and post-test, resulting in the aforementioned figures.

Material used in the lectures for both groups was taken primarily from the course textbook, Basic Economics, by Edwin L. Dolan; 1980; The Dryden Press. Although some supplemental references were utilized, the majority of material was taken from the textbook. In selecting audio-visual aids for integration into the instruction of the experimental group, special attention was given to insuring that the aids complemented the lecture material. In this particular study, the following audio-visual aids were utilized.

1. 16mm motion picture film (sound).
2. 35mm slides.

3. sound film strips.

4. overhead transparencies.

Although some may consider the chalkboard a visual aid, this study has not made such a presumption. Chalkboards have been utilized in conjunction with traditional forms of instruction. In this study, chalkboards were available and were used during presentations to both groups.

Lesson plans were formulated for each instructional period to insure that the main objective of each class lecture was accomplished. The lesson plans also provided cues as to where to introduce a particular audio-visual aid. During the experiment, the lesson plans proved to be an invaluable means for managing classroom instruction.

During the first instructional period, students in both the experimental and control groups were administered a pre-test. The pre-test consisted of fifty items, to include twenty-five multiple choice and twenty-five true and false statements. The same statements were rearranged and administered as a post-test at the conclusion of the experiment. In preparing the test that had been utilized as a pre-test and post-test, questions were selected from the instructor's manual, which accompanied the course textbook. Questions were selected which were representative of the material covered throughout the experiment. An assumption was made that the measurement instrument (pre-test and post-test), which would be used to test the students, was based on an interval means of measurement. An interval means of

measurement was essential since this study was intended to analyze the eventual grade point averages utilizing the student t-test.

After the pre-test was administered, the student answer sheets were graded and the results retained for later analysis. It should be noted that students used IBM (mechanically graded) answer sheets during the pre-test and post-test. Since the grading of these tests were mechanical, student answer sheets were spot checked to insure correct grading by the machine.

The pre-test results were not shown to the students until after the completion of the experiment. These procedures were adopted for several reasons. First, in adherence with principle of "ceteris paribus," it was felt that to inform the students of their pre-test results may create additional factors which could influence the final results. For example, a student who was informed that he received a very low pre-test score may be motivated to a high degree to improve his performance. If he were to score high on the post-test, his performance would be attributed to his increased motivation and not to the use of audio-visual instruction. Undoubtedly, such a situation would create a dilemna when interpreting the results of the study.

During the last instructional period, both groups were administered a post-test. As noted earlier, the post-test was nothing more than a rearrangement of the questions utilized in the pre-test. Also, it was assumed that the maturation process would not affect the post-test scores.

Since the students again utilized a machine graded IBM answer sheet, the completed answer sheets were spot checked to insure correct grading by the machine.

PROCEDURES FOR TREATING DATA

Once the data had been assembled and difference in grade point averages noted, the averages were submitted to a t-test to determine the significance between the means of the samples. The null hypothesis tested was: There is no significant difference between the GPA mean score of students attending an audio-visual supported practice and those students attending without audio-visual supported practices. The hypothesis was tested at the .05 level of significance, utilizing the degrees of freedom available, which were 66, H_o: E = C. The alternative hypothesis is H_a: E ≠ C.

RESULTS AND FINDINGS

The random sampling technique that was used in the investigation included a total of 75 students that were studied. Statistical analysis of these students are reported in Appendix A.

The group that received minimal lecture and a heavy exposure to audio-media was found to have a mean score of 2.56 and a standard deviation of 1.17. The group that received lecture material in the traditional manner was found to have a mean score of 2.67 and a standard deviation of .94.

This showed a mean score difference of .11. This data is reported in Appendix C.

An analysis of the data was then performed to determine if this difference was significant. An independent t-test for testing the significance of the difference between two independent sample means was used for the analysis. The desired level of significance was established at .05. The degrees of freedom were calculated. Since the experimental group contained 32 scores, and the control group contained 36 scores, the degree of freedom was calculated to be 66. Next, the critical t value was established. By referring to a table of critical t values, it was found that for 66 degrees of freedom, the critical t value at the .05 level of significance was 2.01 for a two-tailed test. The standard procedure for t-testing was then employed. When the calculations were completed, the calculated t value was found to be .4219. Since the calculated value of t did not exceed the critical value of t, the null hypothesis that there is no significant difference between the GPA mean score of students attending an audio-visual supported practice and those students attending without audio-visual supported practices failed to be rejected. Final grade point average frequency results are depicted in Appendix D.

The information in Appendix B indicates that differences in mean scores on the pre-tests and post-tests between the experimental and control groups in the Winter Quarter, 1981-1982, were not significant at the .05 level of significance.

The attrition rates of both groups were also compared, but since they were significantly low, they had little effect on the final results. In the process of comparing semester attrition rates, it was determined that the number of students withdrawing from the course did so before the first test. (See Appendix E.)

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

An analysis of the data obtained from this investigation failed to reject the null hypothesis. This indicates that students who received audio-visual supported practice will not necessarily receive a higher grade point average than a student who has received traditional lecture practice methods.

As a direct result of this study, the following recommendations were made:

1. Continue to explore new and better ways of presenting economic concepts to non-economic majors.

2. Search for additional ways to personalize instruction. Audio-tutorial methods and materials used alone tend to impersonalize the learning environment.

3. Provide alternative instructional programs in economics for different types of students. Possibly through early testing, students could be programmed into an economic class that would have the most learning potential for them. Some students prefer a highly structural course, and others

may perform better in an audio-tutorial or some other non-traditional program.

This study provides a base for future studies and experimentation in the area of instructional methods. Research documentation is needed, as Moldstad (1974:29) notes, if media directors are to justify their audio-visual programs. If future audio-visual programs are to survive, they must provide measurable results. Results clearly indicate that audio-visual aided instruction is effective. It is hoped that new imaginative instructional strategies will more perfectly meet the needs of students in the years ahead.

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APPENDIXES

APPENDIX A

Composition of Control and Experimental Classes

	Experimental		Control	
	Number	Percent	Number	Percent
Freshmen	22	62.9	29	72.5
Sophmore	13	37.1	11	27.5
Males	22	62.9	24	60
Females	13	37.1	16	40

APPENDIX B

Analysis of Pre-Test and Post-Test Data

Test	Class	Number	Mean	Standard Deviation	t-test value
Pre-test	Experimental	35	47.66	8.70	1.29
	Control	40	45.20	7.70	
Post-test	Experimental	32	80.19	10.57	1.15
	Control	36	82.25	9.19	

APPENDIX C

Basic Data for Experimental and Control Group

	$\bar{X}$	SD	N
Experimental Group	2.56	1.17	32
Control Group	2.67	.94	36

APPENDIX D

Final Grade Point Average Frequency

Class	Number	4	3	2	1	0	W
Experimental	35	6	12	10	2	2	3
Percent		17%	34%	29%	6%	6%	9%
Control	40	7	14	12	2	1	4
Percent		18%	35%	30%	5%	2%	10%

APPENDIX E

Comparison of Attrition
Between the Control and Experimental Classes

Class	Students Starting Class	Withdrawals	Percentage of Attrition
Control Group	40	4	10%
Experimental Group	35	3	8.5%

There are no significant differences between the two groups.

All students, who withdrew, did so before the first test.